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Comparative analysis of the autopsy reports of Destiny Jacobo and Eliza Jane Scovill

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Abstract

Destiny Jacobo, a 21 month-old Hispanic female toddler, died suddenly in December of 1995 in Los Angeles, California. The Los Angeles County Coroner, Dr. James K. Ribe, conducted an autopsy on Destiny on December 9, 1995 (Case No 95-09550). Ribe listed the cause of death in his report of February 13, 1996 as shaken baby syndrome with associated head trauma. He also alleged that there was forcible rectal insertion causing a retrorectal contusion. Destiny's parents were accused of abusing and killing their daughter. They were convicted and sentenced to life in prison. The mother has been incarcerated since 1996; the father served five years of a life sentence before being released in 2001. Destiny's family and their attorney requested that I review the autopsy report to identify the probable cause(s) of their daughter's sudden acute illness and death. My analysis of the autopsy report indicates that the child died as a result of infections and vitamin K deficiency. It also shows that the allegation of sexual abuse is not supported by medical facts.

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Keywords: shaken baby syndrome (SBS), child abuse, head trauma, autopsy inconsistencies

Summary of the case and findings

Destiny Jacobo, a 21 month-old Hispanic female toddler, died suddenly in December of 1995 in Los Angeles, California. The Los Angeles County Coroner, Dr. James K. Ribe, conducted an autopsy on Destiny on December 9, 1995 (Case No 95-09550). Ribe listed the cause of death in his report of February 13, 1996 as shaken baby syndrome with associated head trauma. He also alleged that there was forcible rectal insertion causing a retrorectal contusion. Destiny's parents were accused of abusing and killing their daughter. They were convicted and sentenced to life in prison. The mother has been incarcerated since 1996; the father served five years of a life sentence before being released in 2001.

Destiny's family and their attorney requested that I review the autopsy report to identify the probable cause(s) of their daughter's sudden acute illness and death. I usually release my findings after reviewing the medical records, the autopsy report, and the pertinent published medical. In this case, I have reviewed only the autopsy report. The child's medical records and the H&E stained tissue sections have been requested.

My conclusion after reviewing Ribe's autopsy report is that his findings do not support the diagnosis of child abuse and shaken baby syndrome. My analysis of the autopsy report indicates that the child died as a result of infections and a vitamin K deficiency. It also shows that the allegation of sexual abuse was not supported by medical facts. I will update my report in this case after reviewing the child's complete medical records, the H&E stained tissue sections of organs obtained at autopsy, and the pertinent medical literature.

Below is a list of my specific findings in Destiny's case:

1) Ribe described bleeding in the head region and in many locations in Destiny's body that include spinal cord, chest, in-

ternal organs and tissues in the chest and abdomen, and in the legs. These data indicate that the bleeding in this case was caused by infections and metabolic problems such as acute inflammation of the pancreas and vitamin K deficiency. The medical supporting my diagnosis of an acute pancreatitis and vitamin K deficiency are presented in Section 1 of this report.

- 2) Medical evidence shows Destiny suffered from pulmonary edema and/or pneumonia. The child's lungs were 142% of average considered normal for her age.
- 3) The medical evidence clearly shows that Ribe's allegation of sexual abuse is not supported by facts. Ribe alleged that the retrorectal bleeding observed in this case was caused by the insertion of an object by force through the anal canal and the rectum. I believe that it is not medically possible to insert an object through the anal canal and the rectum of a child by force without causing injury and bleeding. Ribe's examination of Jacobo's anal canal and the rectal mucosa and the wall revealed no injury or bleeding in these regions. I describe my findings on this issue in Section 2 of this report.

Further more, the medical evidence in this child's case gives a clear example showing that Ribe gave different interpretations to similar medical events found in Destiny Jacobo and Eliza Jane Scovill cases to support his diagnosis. For example, both Destiny's and Eliza Jane's body weight at the time of autopsy were at the 10th percentile. He cited the body weight in Eliza Jane's case as evidence of AIDS while calling the body weight normal in Destiny's case. Additionally, although Destiny's thymus weight was 25% less than that of Eliza Jane, Ribe characterized the thymus weight in Eliza Jane's case as an indicator of AIDS but did not remark on or explain the cause(s) of the thymic atrophy in Destiny's case or consider it in his diagnosis.

1. Distribution and nature of bleeding observed in Destiny's case are indicative of vitamin K deficiency, acute pancreatitis, diabetes, and sepsis

Destiny Jacobo, a 21 month-old Hispanic female toddler died suddenly in December of 1995 in Los Angeles, California. The Los Angeles County Coroner, Dr. James K. Ribe conducted an autopsy on Destiny on December 9, 1995 (Case No 95-09550). Ribe listed the cause of death in his report of February 13, 1996 as shaken baby syndrome with associated head trauma.

Careful analysis of Ribe's autopsy report on Destiny indicates that he overlooked the factual causes of the bleeding and other pathologic changes observed in this case. The distribution and the nature of the bleeding observed by Ribe do not support his conclusions that she died as a result of Shaken Baby Syndrome (SBS) and trauma to the head. The theory of SBS states that vigorous shaking of the baby's head for one minute or more will cause subdural and retinal bleedings. In Destiny's case, Ribe described bleeding in the head region and in many other locations of the body [1].

The following is a list of locations other than Destiny's head and neck regions where bleeding was noted: (1) spinal cord region (acute subdural hemorrhage in thoracolumbar); (2) chest; (3) left anterior axillary fold; (4) right calf; (5) right popliteal fossa; (6) right hip and lower extremity; (7) left lower extremity; (8) parietal pleura (left of subclavian area); (9) anterior aspect of the urinary bladder; (10) parametria area; and (11) retrorectal space.

The medical evidence presented in Ribe's autopsy report indicate that the bleeding in this child's case was caused by metabolic problems such as vitamin K deficiency, pancreatitis, diabetes, and infections. The autopsy report contains evidence that shows Destiny suffered from acute pancreatitis, vitamin K deficiency, and pneumonia. Below are descriptions of the mechanisms involved in causing bleeding and edema in children suffering from acute pancreatitis and vitamin K deficiency.

1.1 Evidence of acute pancreatitis and the mechanisms that lead to edema and bleeding in tissues

The medical evidence described in Ribe's autopsy report indicates that Destiny suffered from acute pancreatitis. *There was focal hemorrhage at the tail of pancreas, and the peritoneum cavity contained 20 ml of fluid. In addition, the mucosa of the stomach was pale and edematous. The child's body also had diffuse, slight peripheral edema.*

Acute pancreatitis also causes bleeding and edema in various parts of the body as observed in Destiny's case. Below is a description of the mechanisms that lead to the development of acute edema and bleeding in various locations in children suffering from acute pancreatitis.

1.1.1 Mechanisms that lead to the formation of edema and bleeding in tissues

The pancreas is a large gland located behind the stomach and close to the duodenum which secretes alkaline fluid (pH 8.0) containing about 20 enzymes. These enzymes include amylase; lipolytic enzymes (lipase, phospholipase A, and cholesterol

esterase); proteolytic enzymes (trypsin, chymotrypsin, carboxypeptidases, aminopeptidases, and elastase); and ribonucleases [2, 3]. These enzymes are needed to perform the major digestive activity of the gastrointestinal tract.

The inflammation of pancreas usually causes the release of the digestive enzymes to the adjacent tissues, abdominal and peritoneal cavities, and the blood stream. Activated proteolytic enzymes, especially trypsin, not only digest pancreatic and peripancreatic tissues, but also can activate other enzymes, such as elastase and phospholipase.

Active enzymes digest cellular membranes and cause proteolysis, edema, interstitial hemorrhage, vascular damage, coagulation necrosis, fat necrosis, and parenchymal cell necrosis. In addition, cellular injury and death result in liberation of activated enzymes.

Activation and release of bradykinin peptides and vasoactive substances (e.g. histamine) are believed to produce vasodilation, increased vascular permeability, and edema in distant organs [2, 3].

The local and systemic complications of acute pancreatitis may include: ascites, massive intraperitoneal hemorrhage, atelectasis mostly of the left lung, hypotension, hypovolemia, nonspecific ST-T changes in electrocardiogram, disseminated intravascular coagulation (DIC), erosive gastritis, gastrointestinal hemorrhage, hyperglycemia, hypoalbuminemia, hypocalcemia, and fat necrosis [2, 3]. *The evidence presented in Ribe's autopsy report indicates that Destiny suffered from hypovolemia, gastritis, ascites, and disseminated intravascular coagulation (DIC).*

Shock is not unusual in cases of acute pancreatitis and may result from (1) hypovolemia secondary to exudation of blood and plasma proteins into the retroperitoneal space; (2) increased formation and release of kinin peptides which cause vasodilation and increased vascular permeability; and (3) systemic effects of proteolytic and lipolytic enzymes released into the circulatory system. *Ribe stated that Destiny's kidneys were pale pink with slight medullary congestion, an observation consistent with shocked kidneys.*

Chapoy *et al.* evaluated nine cases of non-traumatic acute pancreatitis in children and found four of them suffered from shock [4]. Also, Berney *et al.* evaluated 21 children who had acute pancreatitis and found that one third (33%) had hypovolemic shock related pancreatitis [5].

1.1.2 Common causes of acute pancreatitis in children

Acute pancreatitis (AP) involving children is most commonly caused by non-traumatic causes. Some of the causes of AP in children include: infection with the mumps virus (even in the absence of parotitis); hepatitis B virus, coxsackie B5 virus, Epstein-Barr virus, and influenza B virus; mycoplasma; diabetes mellitus (ketoacidosis); malnutrition; drugs; and idiopathic vasculitis [2, 3, 7]. Chapoy *et al.* evaluated nine cases of AP and none of those cases were caused by trauma [4]. *The medical examiner should have evaluated these etiologies using differential diagnosis prior to concluding that the bleeding in this case was caused by trauma.*

1.2 Vitamin K deficiency causes subdural bleeding and bleeding in other locations in children

Vitamin K is essential because it has a coagulation activity and is important for calcification of bones. It is essential because the 1,4 naphthoquinone nucleus cannot be synthesized by the body. However, bacteria in the intestinal tract synthesize vitamin K and can supply part of the vitamin K requirement. Chronic treatment with antibiotics, anti-fungal, or other drugs that inhibit bacterial growth and/or diarrhea can cause vitamin K deficiency. The deficiency of vitamin K causes bleeding in both children and adults. It also increases the risk for bone fractures.

Vitamin K controls the formation of coagulation factors II (prothrombin), VII (proconvertin), IX (Christmas factor), and X (Stuart factor) in the liver. Other coagulation factors that depend on vitamin K are protein C, protein S, and protein Z. Furthermore, two bone matrix proteins necessary for normal bone metabolism are vitamin K dependent.

All of these vitamin K-dependent proteins contain the amino acid γ -carboxyglutamic acid and the carboxyl groups of the glutamic acid residues provide the vitamin K-dependent proteins with characteristic calcium and phospholipid binding properties [8, 9].

1.2.1 Bleeding caused by Vitamin K deficiency in children

Children who develop vitamin K deficiency usually suffer from bleeding in the subdural space, brain, spinal cord, body cavities, muscles, skin, and other locations as was observed in Destiny's case [6, 10-13]. In a study conducted in Japan, intracranial hemorrhage was observed in 353 cases out of 473 infants who suffered from vitamin K deficiency [10]. Additionally, bleeding in the brain was observed in eleven infants who developed vitamin K deficiency. The localizations of the intracranial hemorrhage were as follows: intracerebral (91%), subarachnoid (46%), subdural (27%), and intraventricular (27%) [11].

Furthermore, 15 infants who developed bleeding in the brain and other locations were found to be suffering from vitamin K deficiency. In nine infants, cranial tomography (CT) was taken and showed intraparenchymal, intraventricular, and subarachnoid hemorrhage. In addition, two infants had neurologic manifestations and hemorrhagic findings in the cerebrospinal fluid. Skin bleeding (ecchymosis) was also observed in three patients [12]. **The bleeding locations described in these children are similar to those described by Ribe in Destiny's case.**

The diagnosis of vitamin K deficiency is suspected on the basis of symptoms, signs, and a history suggesting the possibility of vitamin K deficiency. It is confirmed when the PT and PTT are prolonged [8]. It is unfortunate that Ribe did not consider vitamin K deficiency in this case.

1.2.2. Vitamin K deficiency can lead to bone fracture and bone abnormalities

In addition to bleeding, vitamin K deficiency also causes bone problems in children and adults because it is essential for

calcification of bones. Two bone matrix proteins necessary for normal bone metabolism are vitamin K-dependent. All of these vitamin K dependent proteins contain the amino acid γ -carboxyglutamic acid and the carboxyl groups of the glutamic acid residues provide the vitamin-K-dependent proteins with characteristic calcium and phospholipid binding properties [8, 9].

Examination of Destiny's skull by x-ray revealed evidence of bone defect and/or healed fracture in the frontal skull. Two lucent defects were observed. The first defect is approximately 5 mm long with slightly irregular edges and is associated with a 3 mm defect in the outer table of the skull consistent with fracture. There were also two small radiopaque densities just external to the outer table defect. The second defect is approximately 2.5 cm long. This defect is also consistent with a fracture.

The bone defects observed in Destiny's case may also represent a local bone defect caused by vitamin K deficiency and followed by healing as shown in the following two cases. Fenton et al. evaluated two American infants who had massive intracranial hemorrhage, no history of trauma, and radiographic findings that were initially interpreted as linear parietal fractures [14].

The radiographic findings raised the possibility of non-accidental trauma in these infants.

The investigation revealed that both infants had severe coagulopathy, one due to hemorrhagic disease of the newborn (vitamin K deficiency) and the other due to disseminated herpes simplex virus infection. Both infants died. At autopsy, the parietal bone abnormalities were found not to be fractures, but proved to be an anomalous suture in one infant and a connective tissue fissure in the other [14].

It seems that Ribe did not do differential diagnosis to find the likely cause(s) of the bone defects observed in Destiny's case. Investigating this issue in a scientific manner may have revealed the factual cause(s) of the defects in the skull and could have helped in explaining the causes of bleeding and death. It seemed that the bleeding and the bone defects in Destiny's case occurred at different times. Vitamin K deficiency should be investigated in cases of children who have bone fractures and abnormalities associated with bleeding in tissues other than the locations of the bones showing the defects.

1.3 Evidence of pneumonia

Ribe described Destiny's lungs as dark red and purple, airless, somewhat congested with minimal edema fluid. The weights of left and right lungs were 90 g and 100 g, respectively. The total lung weight was increased by 42% of average normal for age as shown in Table 1. These data point to the possibility that Destiny had bleeding in the lungs and she suffered from pulmonary edema and/or pneumonia. Ribe did not provide any information about the nature of the microscopic lesions observed in the lungs or investigate the cause(s) of the significant abnormal increase in the lung weight and the other abnormalities observed.

Table 1. Destiny had abnormal lung weight

Organ Type	Observed weight (g)	Expected weight (g) for age	Observed weight, % of normal
Left lung	90	62	145
Right lung	100	72	139
Total lung	190	134	142

Destiny suffered from severe thymic atrophy [1]. Her thymus weight is about 25% of normal. The thymus weight indicates that Destiny suffered from infections for about three weeks. At this time, the H & E stained tissue sections of the lungs are not available to examine in order to discern the nature of the changes in the Destiny's lungs. However, I am requesting the H & E stained tissue sections of the lungs and other organs and will examine these tissues and describe the microscopic changes that occurred in the lungs and other organs.

2. No Evidence of Sexual Abuse in Destiny's Case

Ribe examined the retrorectal area in Destiny's case and found two small areas of hemorrhage. The first bleeding (1-1/2 inch) was located in the anterior presacral fascia and the second bleeding was observed behind the rectum at the approximately S5 level.

He concluded that this bleeding was caused by forcible rectal insertion of an object [1].

His allegation indicates that Destiny was sexually abused.

My review of the medical evidence described in Ribe's autopsy report shows clearly that Ribe's conclusions and allegations are not medically valid. The following are medical facts and data that support my conclusions:

(1) Inserting an object through the anal canal and the rectum of a child by force will cause injury and bleeding. Ribe's examination of Destiny's anal canal and the rectal mucosa and the wall revealed no injury or bleeding. He stated that (a) no definite surface lesions were seen on the buttocks; (b) careful examination of the anal area revealed that the anus was not dilated and had no tears or bruising; (c) the anal mucosa was unremarkable; (d) examination of rectum and the intestinal tract revealed no damage or bleeding in the rectum or any place of the GI tract.

2) The retrorectal space is one of the pelvic spaces. It is located outside the rectum. I believe that it is not medically possible to cause contusion in the retrorectal space with an object inserted by force through the anal canal and the rectum of a child without causing damage and bleeding in the anal and the rectal regions. As stated above, these two regions were intact.

(3) The medical evidence presented in Ribe's report shows that Destiny had a bleeding problem and inserting a catheter in the urethra caused significant bleeding. Ribe stated that the vulva was unremarkable except that there was a ¼ inch zone of red mucosal hemorrhage surrounding the superior and lateral margins of the urethral meatus in the association with the catheter. This medical evidence supports my statement as described above in (2).

(4) Ribe also observed bleeding internally in other locations of Destiny's body but did not attempt to provide the cause(s) for the bleeding. He found a 3-inch zone of hemorrhage in the parietal pleura (left of subclavian area). In addition, he observed perivesical hemorrhage on the anterior aspect of the urinary bladder and hemorrhage in the parametria area. These medical data clearly show that Destiny had bleeding problems and that Ribe selected only the bleeding in the retrorectal space to support his false allegation of sexual abuse.

3. Medical evidence in Destiny Jacobo's case shows Ribe manipulated medical facts in Eliza Jane's case

The medical data presented in Ribe's autopsy reports in the cases of Destiny Jacobo and Eliza Jane Scovill clearly indicate that Ribe did not do differential diagnosis in either case and his diagnoses were wrong in both cases [1, 15]. In addition, he provided different interpretations for similar data observed in both cases to support his allegations. Below is a comparison between Ribe's findings in Destiny's case and Eliza's case to illustrate these points.

3.1 Ribe interpreted medical data differently in Eliza Jane's and Destiny's cases

- (1) Destiny's and Eliza Jane's body weight at time of autopsy were both at the 10th percentile rank (Table 1). Ribe called the body weight in Eliza Jane's case an indicator of AIDS illness. However, he defined Destiny's body weight as that of a normal child.
- (2) Destiny's and Eliza Jane's height at the time of autopsy were at 10th and 5th percentile (Table 1). Ribe called the height in Eliza Jane's case an indicator of AIDS illness and stated that Destiny's height is within the normal range.
- (3) Destiny's and Eliza Jane's thymus weights were 6 g and 8 g, respectively (Table 1). Ribe called the thymus atrophy in Eliza Jane's case an indicator of AIDS, but made no remark about Destiny's thymus size. Destiny also suffered from thymic atrophy and her thymus was 25% smaller than Eliza Jane's thymus.

Ribe stated that Destiny's thymus was very small, pale whitish-yellow nub with no recognizable lobar lobulation.

Table 2. Comparative body and thymus weights for Destiny Jacobo and Eliza Jane

Parameters	Destiny Jacobo	Eliza Jane Scovill
Body weight (pounds)	22	29
Body weight percentile	10th	10th
Height (inches)	21	23
Height percentile	10th	5th
Thymus weight (g)	6	8

3.2 Effects of adverse reactions to amoxicillin on organ weights

The information presented in the autopsy report in Destiny's case gives the opportunity to compare the organ weights in a child with a problem in the lungs (Destiny) and a child who died as a result of acute adverse reaction to amoxicillin (Eliza Jane). The organ weights and the organ weights as a percent of average normal weight for age for these two children are presented in Tables 2 and 3.

These data clearly show that in Eliza Jane's case, the weight of the lungs, heart, and kidneys were significantly increased as compared with normal. However, in the case of Destiny, only the lung weight was significantly increased as compared with normal weight. In addition, Eliza Jane also had pericardial and pleural effusion whereas these abnormalities were not observed in Destiny's case [15].

These data clearly support my analysis and diagnosis in Eliza Jane's case that she died as a result of allergic reaction to amoxicillin [15]. The increases in organ weight and the abnormal accumulation of fluid in body cavities were induced by the release of vasoactive amines from basophils and mast cells present in tissues. The vasoactive amines increased the permeability of blood vessels and caused the leakage of fluid from the blood vessels into the tissues and body cavities.

Table 3. Comparative organ weights (g) of Destiny Jacobo and Eliza Jane Scovill

Parameters	Destiny Jacobo weight (g)	Eliza Jane Scovill weight (g)
Heart	40	77
Left lung	90	138
Right lung	100	168
Total lung	190	306
Liver	270	500
Left kidney	40	75
Right kidney	40	67
Total kidney	80	142

Table 4. Increases in organ weights other than lungs occurred only in Eliza Jane's case

Parameters	Destiny Jacobo weight % of normal	Eliza Jane Scovill weight % of normal
Left lung	145	179
Right lung	139	189
Total lung	142	184
Heart	100	131
Liver	100	121
Left kidney	100	153
Right kidney	100	140
Total kidney	100	156

4. Conclusions

My analysis of the autopsy findings in Destiny Jacobo's case indicate that Destiny died as a result of infections and vitamin K deficiency. Further, Ribe's allegation of child abuse and sexual abuse are not supported by the medical evidence presented in his report. No damage or bleeding was observed by the medical examiner to indicate the insertion of an object by force. Below is a list of abnormalities observed in Destiny's case that

indicate she suffered from edema of the lungs and/or pneumonia, acute inflammation of the pancreas, and vitamin K deficiency:

- 1) Significant increase in lung weight (142% of average normal).
- 2) Inflammation of the pancreas.
- 3) Gastric edema and peripheral edema
- 4) Severe atrophy of the thymus.
- 5) Bleeding in head, spinal cord, and other locations of the body.
- 6) Two small bone defects in the skull.

Furthermore, the medical evidence in Destiny's case shows very clearly how Ribe gave different interpretations to similar medical events found in Destiny's and Eliza Jane's cases to support his diagnosis. To cite one example, both Destiny's and Eliza Jane's body weight at the time of autopsy were at the 10th percentile. Ribe called the weight in Eliza Jane's case an AIDS indicator and called it normal in Destiny's case. In addition, Destiny's thymus weight was 25% less than that of Eliza Jane's; however, Ribe considered the thymus weight in Eliza Jane's case an AIDS indicator but did not remark on or explain the cause(s) of the thymic atrophy in Destiny's case or consider it in his diagnosis.

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